

BEST AVAILABLE COPY

Our Docket No.: 42P12029



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
McAfee)
Application No.: 10/017,613)
Filed: December 13, 2001)
For: Surface Mount Captive Screw Ferrule)
for PCB)

Examiner: Saether, Flemming

Art Group: 3677

Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER 37 CFR 1.131 IN SUPPORT OF PRIOR INVENTION

Sir :

I, Eric D. McAfee declare:

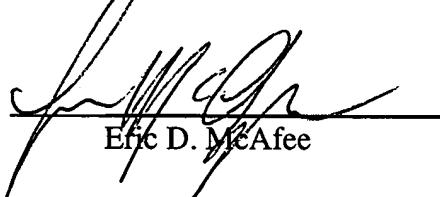
1. I am an inventor of the claims of the above-captioned patent application ("the Application") and an inventor of the subject matter described therein.
2. Prior to April 20, 2001, the filing date of U.S. Patent No. 6,814,530 cited in a Final Office Action mailed May 23, 2005, the invention claimed in the Application had been conceived and reduced to practice in the United States.
3. Attached Exhibit A is a redacted copy of an invention disclosure form describing the design of the Surface Mount Captive Screw Ferrule for PCB, and establishes

BEST AVAILABLE COPY

that the subject matter claimed in the Application had been reduced to practice in the United States prior to April 20, 2001.

I further declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application of any patent issuing thereon.

Dated: 8/11, 2005


Eric D. McAfee



BEST AVAILABLE COPY

INTEL INVENTION DISCLOSURE

Attorney-Client Privileged Communication

Title of Invention: Surface Mount Captive Screws for Board Assemblies.

1. This invention is a means for captivating screws to a board assembly. The core of this invention is a mechanical component (ferrule) that is designed to be packaged, placed, and soldered to board assembly as though it were a PCB component. Through this process the ferrule is soldered directly to the circuit board and can be later used to retain a screw to the board assembly.
2. Many self-captivating screws are actually an assembly two or more parts. I will concentrate on these types of captive screw assemblies in my discussion here. The two main components of these self capturing assemblies are a screw and some form of capturing component. The capturing component is often called a ferrule. The ferrule is designed to both hold the screw while retaining itself to whatever mechanical assembly requires the screw. Currently several hardware vendors offer self-retaining screw assemblies with various style ferrules. Ferrule styles include press-in, flare-in, floating style(which includes a capturing washer on the opposite side), snap-in, and "P.C. Board style". All of these styles are either unsuitable for retention into circuit boards and/or have significant drawbacks when used with a circuit board. The P.C. Board style requires a press fit into board hole and is considered unacceptable by Intel board manufacturing due to the risk of board damage. Of all these styles, the only one that has been successfully used for hardware capture to circuit boards has been the snap-in style. However, this style has several large drawbacks. First, the snap-in style requires a much larger than average thru hole in the board. Second, the snap feature of the ferrule protrudes through the secondary side of the board. This protrusion is often very difficult to accommodate mechanically.
3. Illustration1: Exploded view of circuit board, SMT ferrule, and screw.
4. This invention will be very valuable to those trying to capture hardware to circuit boards. Treating the ferrule as a SMT component will allow a robust attachment scheme that can be completed during the circuit board's normal manufacturing process. This attachment scheme will not require oversized thru holes in the circuit board and will not cause problems on the opposite side since it does not protrude thru the board. Having only the ferrule attached to the circuit board can allow added flexibility downstream by allowing board customers to populate the ferrule with their screw of choice.
5. The core of this invention is a mechanical component (ferrule) that is designed to be packaged, placed, and soldered to board assembly as though it were a PCB component. The ferrule is later used to retain a screw to the board assembly. The novelty of this concept is that the ferrule is retained by direct soldering to the PCB and can be assembled cost effectively by treating it as another surface mount component during board assembly.
6. Closest prior arts are identified above
7. Captivated fasteners on all FRUs are quickly becoming a design requirement for the server industry. Anyone who is designing systems that require captivated fasteners for board retention might be interested in this invention. That list includes but is not limited to Compact, Dell, IBM, HP, NCR, Unisys, Sun, SGI

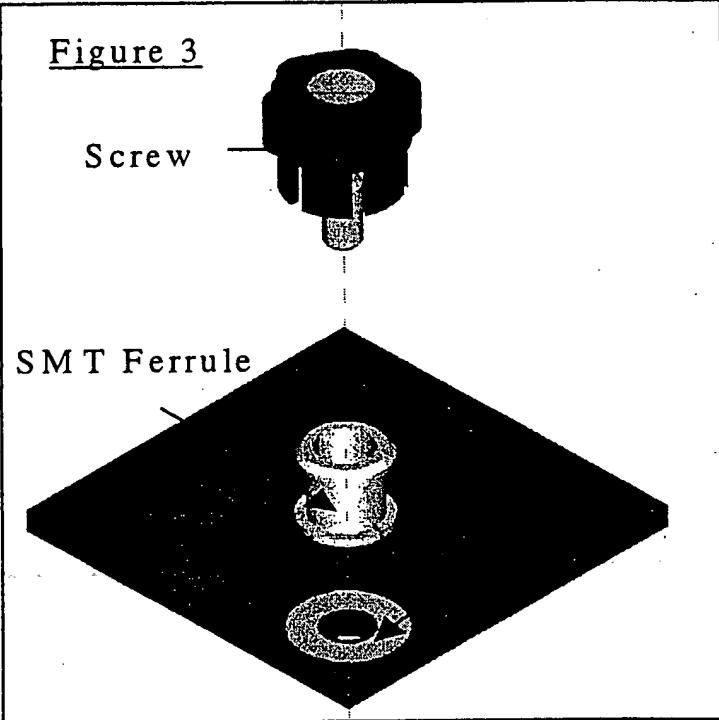


EXHIBIT A